

CLAIMS

1. A member (2) for potential equalising between a first conducting member (4) and a second conducting member (6) of a wind turbine blade (8) comprising
 - 5 - an electrical conductor (10),
 - a first contact part (12) for providing a potential equalising connection between said first conducting member (4) of said wind turbine blade (8) and said electrical conductor (10),
 - a second contact part (14) for providing a potential equalising connection between a second conducting member (6) of said wind turbine blade (8) and said electrical conductor (10),wherein said first contact part (12) is shaped substantially as a ribbon and said first conducting member (4) comprises carbon fibres.
- 15 2. A member (2) for potential equalising according to claim 1, wherein said first contact part (12) comprises a conducting metal ribbon (20) such as e.g. a flexible sheet or a flexible mesh.
3. A member (2) for potential equalising according to any one of the claims 1 to 2,
20 wherein said conducting metal ribbon (20) has a width of more than 1 cm, preferably said conducting metal ribbon has a width of between 2 to 30 cm, more preferably said conducting metal ribbon has a width of between 3 to 10 cm, such as 5 cm.
- 25 4. A member (2) for potential equalising according to any one of the claims 1 to 3, wherein said first contact part (12) further comprises a contact-enhancing layer (22) connected to the side of said conducting metal ribbon (10) to be oriented towards said first conducting member (4).
- 30 5. A member (2) for potential equalising according to claim 4, wherein said contact-enhancing layer (22) extends beyond the conducting metal ribbon (20) in at least one direction in the plane of the conducting metal ribbon (20).
- 35 6. A member (2) for potential equalising according to any one of the claims 1 to 5, wherein said first contact part (12) further comprises a cover layer (24) connected

to the side of said conducting metal ribbon (10) to be oriented away from said first conducting member (4).

7. A member (2) for potential equalising according to claim 6, wherein said cover layer (24) extends beyond the conducting metal ribbon (20) in at least one direction in the plane of the conducting metal ribbon (20).
8. A member (2) for potential equalising according to any one of the claims 4 to 7, having a contact-enhancing layer (22) and a cover layer (24), wherein said contact-enhancing layer (22) and said cover layer (24) extend beyond the conducting metal ribbon (20) in at least two directions in the plane of the conducting metal ribbon (20) and said contact-enhancing layer extends beyond said cover layer in at least two directions in the plane of the conducting metal.
- 15 9. A member for potential equalising according to any one of the claims 4 to 8, wherein said cover layer (24) and/or said contact-enhancing layer (22) is a flexible and conductive material, more preferably said contact-enhancing layer comprises a loose non-woven material such as e.g. a web, a veil or a fleece material.
- 20 10. A member for potential equalising according to any one of the claims 4 to 9, wherein said cover layer (24) and/or said contact-enhancing layer (22) is at least partially impregnated with a resin such as a prepreg or a semi-preg, preferably a single-side-impregnated semi-preg.
- 25 11. A member (2) for potential equalising according to any one of the claims 1 to 10, wherein said second contact part (14) comprises a clamp for connecting to a lightning conductor, preferably a clamp for connection to a lightning conductor cable.
- 30 12. A member (2) for potential equalising according to any one of the claims 1 to 10, wherein said second contact part (14) is substantially equivalent to said first contact part (12).
- 35 13. A member for potential equalising according to any one of the claims 1 to 12, wherein said electrical conductor (10) is a conducting metal ribbon.

14. A member for potential equalising according to claim 13, wherein said conducting metal ribbon (20) is a part of and/or an extension of said conducting metal ribbon of said electrical conductor (10).

5 15. A member (2) for potential equalising according to any one of the claims 2 to 14, wherein said conducting metal ribbon (20) and said electrical conductor (10) are good conductors and relatively inert, preferably said conducting metal ribbon (20) and/or said electrical conductor (10) comprise a metal selected from the group consisting of copper, steel, stainless steel, aluminium, nickel, chromium, tin and 10 silver, more preferably said conducting metal ribbon (20) and/or said electrical conductor (10) comprise copper.

16. A member (2) for potential equalising according to any one of the claims 4 to 10, wherein at least one of said cover layer (24) and/or contact-enhancing layer (22) is 15 a good conductor and relatively inert, preferably said cover layer (24) and/or said contact-enhancing layer (22) comprise a metal selected from the group consisting of copper, steel, stainless steel, aluminium, nickel, chromium, tin and silver, more preferably said cover layer (24) and/or said contact-enhancing layer (22) comprise stainless steel.

20 17. A member (2) for potential equalising according to any one of the claims 15 to 16, wherein at least one of said conducting metal ribbon (20), cover layer (24), said contact-enhancing layer (22) and said electrical conductor (10) comprises a combination of materials.

25 18. A member (2) for potential equalising according to claim 17, wherein said combination of materials is inhomogeneous, preferably

- a layered structure, such as silver-coated tin or silver-coated copper, and/or
- a structure with particulate integrated material, such as a metal with a filler or a polymer with carbon black or metal particles, and/or
- a structure comprising fibres, such as glass fibres, aramid fibres and/or carbon fibres.

30 35 19. A member for potential equalising according to any one of the claims 1 to 16 further comprising at least one further contact part (16) for providing a potential

equalising connection between one or more further conducting members of said wind turbine blade (8) and said electrical conductor (10).

20. A member for potential equalising according to any one of the claims 1 to 19,
5 wherein said first contact part (12) is adapted to provide a potential equalising connection to said first conducting member (4),

characterised in that said first conducting member (4) comprises fibres such as reinforcement fibres in a carbon-fibre and/or glass-fibre reinforced plastic, preferably a significant part of the conductance of said first conducting member is
10 provided for by a carbon fibre component of said first conducting member.

21. A member (2) for potential equalising according to any one of the claims 1 to 20, wherein said conducting metal ribbon (20) is oriented substantially orthogonal to at least some of the carbon fibres of said first conducting member, preferably said
15 conducting metal ribbon (20) is oriented substantially orthogonal to the main orientation of the carbon fibres of said first conducting member.

22. A wind turbine blade comprising
- a member for potential equalising according to any one of the claims
20 1 to 21,
- a first conducting member connected to said first contact part of said member for potential equalising, said first conducting member optionally comprising carbon fibres and
- a second conducting member connected to said second contact part
25 of said member for potential equalising.

23. A wind turbine blade comprising a number of members for potential equalising according to any one of the claims 1 to 21, said members for potential equalising connected to said first and second conducting members are positioned at regular
30 or irregular intervals along the length of said wind turbine blade.

24. Use of a member (2) for potential equalising according to any one of the claims 1 to 21 for potential equalising of conducting members (4, 6) of a wind turbine blade (8).

25. Use of a number of members (2) for potential equalising according to any one of the claims 1 to 21 for potential equalising of two or more conducting members (4,6) of a wind turbine blade (8) at regular or irregular intervals along the length of said wind turbine blade (8).

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26. Use of a member (2) for potential equalising according to any one of the claims 1 to 21 for transferring at least a part of a lightning current to a lightning conductor, such as from a conducting member comprising carbon fibres to a lightning conductor cable (30).

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27. A method for manufacturing of a member (2) for potential equalising according to any one of the claims 1 to 21, comprising the steps of:

- providing a contact-enhancing layer (24) at and/or near a first contact part (12),
- providing a conducting metal ribbon (20) at least in said first contact part (12),
- providing an electrical conductor (10),
- optionally providing a cover layer (24) at and/or near said first contact part (12), and
- providing a second contact part (14).

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28. A method for manufacturing of a member according to any one of the claims 1 to 21, comprising the steps of:

- providing a first conducting member to be potential-equalised,
- providing a contact-enhancing layer (24) at least partially in contact with said first conducting member (4),
- providing a conducting metal ribbon (20) in contact with at least a part of said first conducting member (4) and/or said optional contact-enhancing layer (12),
- providing an electrical conductor (10)
- optionally providing a cover layer (24) in contact with said conducting metal ribbon (20), and
- providing a second contact part (14).

35 29. A method for manufacturing according to any one of the claims 27 to 28, wherein said conducting metal ribbon (20) and said electrical conductor (10) are integrated.

30. A method for manufacturing according to any one of the claims 27 to 29, wherein
at least one of said contact-enhancing layer and said optional cover layer is a
prepreg, a semi-preg or a dry loose non-woven material such as a web, a veil or a
5 fleece material, preferably a single-side-impregnated semi-preg.

31. A method for manufacturing according to any one of the claims 27 to 30, further
comprising the step of:
10 - providing a resin and/or an adhesive in contact with said contact-
enhancing layer(22) and/or said conducting metal ribbon (20) and/or
said cover layer.

32. A method for manufacturing according to any one of the claims 27 to 31, further
comprising the step of:
15 - pre-consolidating said member (2) for potential equalising.

33. A method for manufacturing according to any one of the claims 27 to 32, further
comprising the step of:
20 - curing said member (2) for potential equalising, optionally by a co-
curing process wherein said member (2) for potential equalising and
at least a part of said wind turbine blade are cured together.